ROLE OF 18F-FDG PET/CT FOR EARLY POST-RADIOTHERAPY ASSESSMENT IN SOLITARY BONE PLASMACYTOTOMAS

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BACKGROUND-AIM

Solitary plasmacytomas are rare neoplasms originating from plasma cells in bone, mainly in the axial skeleton (solitary bone plasmacytoma, SBP) or soft tissues (extramedullary plasmacytoma, EP). SBPs and EPs represent about 10% and 3% of plasma cell neoplasms, respectively. According to the Durie and Salmon staging system, SBPs are considered as stage 1 myeloma. Although SBP has the same etiopathogenesis as multiple myeloma (MM), it differs from MM in that clinical features and moreover, the treatment approach also differs since solitary lesions are amenable to local radiation therapy (RT). A possible role of 18F-fluorodeoxyglucose positron emission tomography (FDG PET)/CT in the management of MM has been reported in several studies. It has been shown that this modality, which combines metabolic and morphological information, could be used for staging and assessment of therapeutic response at follow-up and is also a promising tool for evaluation of response to radio-chemotherapy.

The aim of the study was to evaluate the performance and possible prognostic value of early F18-FDG PET/CT assessment after RT in patients with SBP.

METHODS

Twenty-one patients affected by SBP underwent to FDG PET scan for early restaging (≤6 months) post-radiotherapy assessment were selected from the PET databases of UCLH of London and OSR of Milan. Patients with no abnormal uptake were classified as having no pathologic uptake (NPU). A SUVmax cut-off value of 4 was chosen to discriminate minimal residual uptake (MRU: SUVmax ≤ 4) from pathologic uptake (PU: SUVmax > 4). Progression free survival (PFS) rate was estimated using Kaplan-Meier curves and Cox regression analysis.

RESULTS

In 10/21 patients restaged by FDG PET/CT, further previous baseline scan was available also at staging and results showed positive findings at the level of all biopsy-proven disease areas. Considering MRU as PU, FDG PET/CT demonstrated a sensitivity and specificity of 86% and 29%, respectively. Using SUVmax > 4 as the cut-off, sensitivity and specificity were 86% and 93%, respectively. Kaplan-Meier curves revealed a significant difference in PFS probability between patients classified as positive on FDG PET/CT using a cut-off of SUVmax > 4 (PU) and those classified as negative (NPU+MRU) (log-rank, Mantel-Cox P = 0.009; chi-square = 6.85). Cox regression analysis of PFS using SUVmax > 4 as cut-off revealed an interesting relation in prediction of progression (HR 9.458).

CONCLUSION

PET/CT for early restaging after RT in patients with SBP should be considered carefully in view of the lack of specificity of a low SUVmax value. The good correlation between a high SUVmax value and follow-up suggests a possible prognostic role for PET/CT in respect of disease progression at early restaging after RT.